Armenia International Outmigration:

An Exploration on the Effects on Armenian Households' Welfare

Poverty and Equity GP – The World Bank[1]

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Summary

This report analyzes issues related to international migration in Armenia and its impact on Armenian households' welfare. The report uses microdata coming from two recent household surveys, the 2017 Russian-Armenian University survey, a nationally-representative household survey focused on international migrants and their origin households, and the 2017 Integrated Living Conditions Survey, a nationally-representative household survey conducted by the Statistical Committee focused on welfare measurement but also with information on international migrants.

The report finds that among international migrants, there are differences between temporary and permanent migrants. Permanent migrants tend to be younger, more educated and are more likely to come from secondary cities. In contrast, temporary migrant tends to be a bit older, less educated and are more likely to come from rural areas. Employment prospects for both groups are very limited at the moment they leave the country, with employment rates around 25 percent. They tend to migrate largely to the Russian Federation, where they are hired almost exclusively by private firms. Temporary workers mostly work in the construction sector, while permanent workers show more diversity across sectors of employment.

With respect to the welfare of Armenian households with migrants abroad, both surveys show that households with migrants are spread roughly evenly across deciles of the consumption distribution and remittances represent between 30 and 40 percent of the income of recipient households, depending on the source of information. The pattern of spending of the remittances for households with migrants abroad suggests that households with temporary migrants are less well off, as they use more of these resources for basic expenses, like food and clothing.

A microsimulation based on counterfactuals without migration estimates the poverty reducing effect of remittances between 3 and 5 percentage points. These simulations are a methodological improvement with respect to naïve simulations available in the literature, where remittances are assumed to be exogenous. The counterfactual scenarios modelled consider the potential employment and earnings situation of the migrants if they would have stayed in Armenia, under different assumptions, controlling also by potential biases in the migration and employment decisions. Inequality is also affected by

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migration. The Gini coefficient increases from the 28.9 points in the actual scenario with migration to 31.6 points under the counterfactuals.

Armenia can harness the potential of their seasonal and permanent migrants for fostering the development of the country by implementing the right policies. For seasonal migrants, it can conduct policy efforts focused on removing potential restrictions that low-skilled emigrants may face along with helping the reintegration of returnees. For permanent migrants, policy efforts should be concentrated on fostering the transfer of knowledge and skills from destination countries to Armenia. There are also a number of policies actions that could benefit both migrant types. Policy actions that could benefit both sets of workers include facilitating access to jobs abroad for Armenian workers across skill levels, ensure formal status for workers, diversify host countries to reduce risks, improve the matching of workers to jobs, and promote the more rapid integration of workers in the host country labor market. Finally, given the development impact of remittances, policy efforts should could also centered on steering the use of remittances for investments in human capital or physical assets and small businesses.

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1. Introduction

One of the most important defining traits of Armenia as a country is the large size of its diaspora. Estimates for 2017 based on the population census of destination countries show that close to 1 million Armenians live abroad (World Bank, 2019a). This represents a third of the population living currently in the country, the 7th largest diaspora in the world, among countries with at least one million population. More than half of these Armenians living abroad are located in the Russian Federation (530,00 people) with sizeable groups of ethnic Armenians also present in countries like the United States, Ukraine, France, Uzbekistan and Germany (World Bank, 2019a). Moreover, this estimate may represent a lower bound, as Armenia has a long tradition of emigration dating back in modern times to the early twentieth century, and many second, third or further generations descendants may not self-identify themselves while keeping cultural ties to their homeland.

The flow of outmigrants continues in the present. While the availability of the flow of migrant data in Armenia is limited, in part due to methodological challenges involved in collecting this type of information, recent studies point to the fact that the flow of emigrants continues to the present. As the Armenian-Russian Slavonic University (2015) study notes, for instance, the share of total population participating in short-term migration increased from 24.3 percent in 2007-13 to 33.8 percent in 2012-15.

A large diaspora has the potential to have positive impacts on the Armenian economy. Remittances resulting from migration augment household income, contributing to increasing consumption of migrant households and reducing poverty, albeit limited, in rural and secondary city households (World Bank, 2017). In fact, remittances make up to 14 percent of Armenia's GDP (World Bank, 2018) ranking Armenia among the top 20 countries worldwide for receiving remittances. Moreover, a large population living abroad may open opportunities for business connections or for access to information and technologies otherwise not available in the country.

However, the continuous flow of outmigrants poses challenges to the Armenian society and economy. Coupled with shrinking working-age population, out-migration of workers in general reduces the size of labor force and exacerbates the aging of the society (World Bank, 2019b). Even in a scenario without migration, the share of population 65 years old or older would increase from 11 percent in 2015 to 22 percent in 2020 (United Nations, 2017), increasing the burden on a shrinking working age population to provide for pensions and additional expenses in care and health services. In addition, while higher earnings from migration may cushion labor-side impacts in the short term and boost economic activities, the high dependency in a few destination countries make the migrants earnings vulnerable to economic conditions abroad, as seen in recent years of economic contractions owing to negative shocks in oil prices.

In this context, this report aims to better understand the nature of outmigration and its impact on the welfare of households residing in Armenia. The report uses data coming from two recent household surveys to understand better the profile of migrants today in Armenia and the welfare of households in Armenia with a member living abroad, either temporarily or in a permanent basis. The surveys covered a period (after the global financial crisis and the 2015 recession in the Russian Federation triggered by the drop-in oil prices) for which only a few, if any, other studies are available, hence providing new evidence on whether these events had an impact on the quantity or profile of migrants. These findings are expected to contribute to existing analyses of the issue of migration in the country (e.g. ILO (2009), OECD and Caucasus Research Resource Center – Armenia (2017)) to provide evidence to formulate labor market policies and programs that could help to minimize any potential negative impacts from the continuing

outflow of migrants and leverage their potential for the local economy. The study does not address issues related to internal mobility or the welfare of households outside Armenia, where the migrants arrive. Also, the study does not focus on refugees or forced displaced population.

A first contribution is to try to understand better the differences between permanent and temporary migrants, as leveraging their potential for the local economy may require different policy actions. While different studies have addressed the issue of migration and is generally understood that most migrants in Armenia are of a temporary nature (Bellak et al., 2014), this note exploits the information available in the 2017 RAU survey to differentiate between the permanent and temporary migrants, to identify any discernible socio-demographic characteristics, motivations for migration and welfare impact on origin households. These differences may merit different types of interventions, for instance, in case educational levels or age profiles are significantly different among these groups.

The second contribution is to understand better the welfare impacts of migrants in Armenian households. The report uses information from the 2017 RAU survey and the 2017 ILCS to validate the profile of migrants identified in the two surveys, and to understand the welfare impacts of remittances in the country. As noted in World Bank (2014), remittances have played a role for the poverty dynamics in 2010-2013 and they favored more the top 60 percent of the distribution in that period. This note seeks to deepen this understanding of the role of remittances by looking at their importance along the consumption distribution to identify in which income levels the welfare-improving impacts are concentrated.

This note is intended as a first building block for assessing possible impact of migration on welfare and labor markets in Armenia. This note is intended as an initial analysis of the information available in recent household surveys to continue strengthening the analytical basis for policy-making related to migration and remittances. For instance, Karapetyan and Harutyunyan (2013) identified potential negative impacts of remittances on employment for origin households and positive impacts on welfare, results that given the availability of more recent and comprehensive microdata could be explored in more detail in future work. The World Bank team working in Armenia will continue deepening on this research agenda.

The note is organized as follows. Section 2 presents the microdata used for the study. Section 3 presents the profile of migrants, for temporary and permanent migrants. Section 4 presents the results of a microsimulation aimed at understanding the impacts of migration and remittances on welfare levels in the country. Section 5 discusses policy implications related to the findings of the study.

2. Data

The first source of information for this note is the microdata from the 2017 round of the International Migration survey conducted by the Russian-Armenian University. This nationally-representative survey was conducted in the context of a three-year project focused on monitoring of the state of external migration of the Republic of Armenia (2015 - 2017). The project aims at monitoring external migration in Armenia through the analysis of microdata data collected from three rounds of the survey, between 2015 and 2017. The focus of the survey is to identify demographic and economic characteristics of households with a migrant member and returnees, migration drivers and destinations of migration. The questionnaires include a rich battery of questions on the quality of employment and the strategies used by migrants currently living abroad. The field work for this survey was conducted between May and July

2017. The most important tabulations and messages from the survey are available on Armenian-Russian (Slavonic) University (2017).

An important caveat of the information available in this survey is that only captures information on international migrants who were still considered to be part of a household in Armenia between 2014 and 2017. This means that if an entire household has migrated out of Armenia, they will not be captured as part of the international migrants in the survey, leading to the undercounting of migrants. In addition, the survey collects information only on international migrants who were still considered household members. If an international migrant left a household recently, and is not any more considered a member, then he or she will not be captured in the survey, contributing, as well, to an undercounting of migrants.
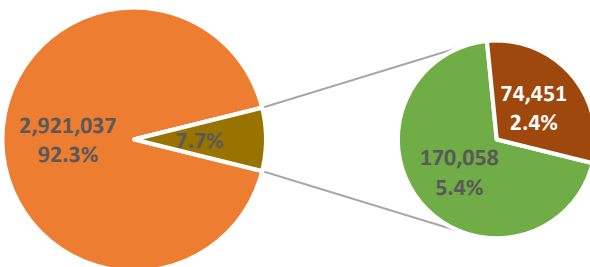
Another important caveat is that the survey does not collect objective welfare information. Although the questionnaire captures detailed information on socio-demographic characteristics, employment and questions related to the experience of migration (e.g. methods to find jobs abroad, quality of employment), the survey does not collect either household consumption or income nor assets and durable good owned by the household. The only information available about well-being is on the self-reported subjective financial situation, which, though informative, is not directly comparable with information on objective well-being. This limits considerably the scope of welfare analysis that is possible to conduct directly with the data.

To compensate for this limitation, the note also analyzes information on migrants' origin households coming from the 2017 round of the Integrated Living Conditions Survey. The Integrated Living Conditions Survey (ILCS) is the official source for welfare and poverty information in the country and has been conducted since 2001 on annual basis. The survey results are used to estimate consumption-based poverty in the country, as well as to provide valuable information on households' livelihoods using other indicators. Checks were conducted to make sure the groups of migrants identified in both surveys are similar. In a similar way than for the RAU survey, the number of migrants reported in the ILCS refers only to migrants still belonging to local households and who left the country or returned since 2013 (the migration module includes questions on identification of migration status of the household's members, country of destination, reasons for migration, year in which the household member migrated or returned, employment status abroad and remittances). This means that the number of international migrants reported in this survey is also expected to be underestimated. A limitation when using the data from the ILCS is that it does not allow to separate the temporary and permanent migrants.

3. Armenian International Migrants and their Origin Households

Close to 250,000 international migrants are identified in the 2017 RAU survey. These migrants represent close to 8 percent of the population in the country (Figure 1). The calculated actual population living permanently in Armenia in this survey (2.92 million people) is remarkably close to the population calculated by the Statistical Committee living in Armenia in 2017 (2.99 million). The number estimated, however, is considerably lower than estimated coming from population censuses of countries of destination, where close to 1 million international Armenian migrants are identified (World Bank, 2019a). The source for the discrepancy, as mentioned before, is most likely related to the form in which international migrants are recorded in the survey, which requires them to be considered part of a local household and have travelled after 2014.

Figure 1: Close to 250,000 international Armenian migrants are identified…
Distribution of international migrants, Armenia 2017

Figure 2: …and these individuals can be traced back to a fourth of the households in the country
Distribution of households with a member considered international migrant, Armenia 2017
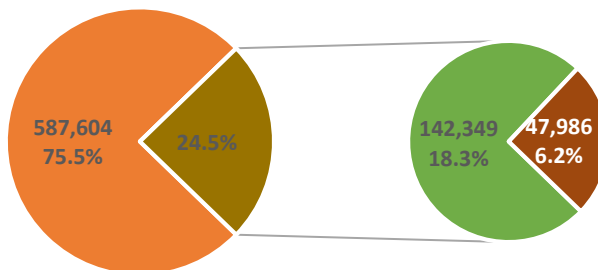
| | No migrant | Temporary Migrant | Permanent Migrant |

Source: Own elaboration based on 2017 RAU survey

Source: Own elaboration based on 2017 RAU survey

Close to three fourths of the international migrants are identified as temporary. International migrants can be classified according to different criteria, as for instance, traveling purpose, time spent abroad, or family reunification. For this report, in order to categorize permanent and temporary migrants (we use the term temporary instead of seasonal to include also those who travel for occasional non-seasonal work opportunities) we focus on the self-reported purpose of the migration, as captured in the RAU survey. According to the categories available in the survey we define as:

- Temporary migrants:
    - o Seasonal job for until 1 year
    - o Non-seasonal job for until 1 year
    - o Study or education
- Permanent migrants:
    - o Long term job for more than 1 year
    - o Family unification
    - o Family, other issues like marriage or divorce
    - o Permanent residence
    - o Forced migration or escape

In addition, we also consider as international migrants those who are currently in Armenia and that have travelled abroad for more than 3 months in the last year for temporary jobs, as they could be back for vacations or waiting for the next work season to start. These are added to the temporary migrants' category. According to these definitions, close to three fourths of the international migrants, or close to 170,000 people are temporary migrants (Figure 1). These migrants can be mapped to slightly more than 140,000 households in the country, meaning that these households have on average 1.2 temporary migrants (Figure 2). Permanent migrants identified in the RAU survey represent around 75,000 people, who are still considered members of roughly 48,000 households. This translates into roughly 1.6 migrants per households, for those households with a permanent migrant.

3.1. International Migrants

Temporary migrants tend to be slightly older and less educated than permanent migrants, but largely predominantly males. In terms of their socio-demographic characteristics, temporary and permanent migrants tend to share a common support, as both groups largest representation come from young adults (20-40 years-old) and general-secondary educated, but still present some differences. In terms of their age, temporary migrants tend to be older due to a larger presence of 40-60-year-old adults, a group that is very small among the permanent migrants (Figure 3). In contrast, permanent migrants report a sizeable share of 0-19-year-old individual, a group almost nonexistent among the temporary migrants. In terms of their education, temporary migrants are more likely to come from general-secondary and less likely to come from higher education than the permanent migrant and the general population (Figure 4). In terms of gender, temporary migrants are almost entirely males (94 percent), compared to a more even distribution of permanent migrants (60 percent males). These differences in skills profiles may reflect to some extent policy constrains, and an agreement for mutual recognition of licenses and training may induce more skilled workers to travel seasonally.

Figure 3: Temporary and permanent migrants largest representation come from young adults but still present some differences in age profile…

Distribution of migrants by age groups, Armenia 2017
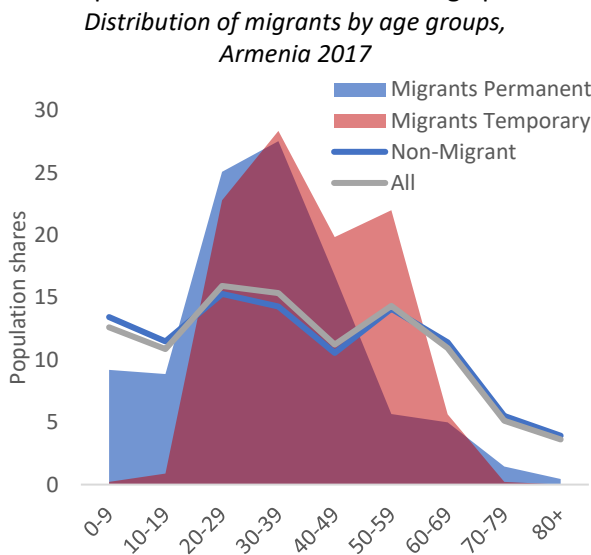
Source: Own elaboration based on 2017 RAU survey

Figure 4: … and in educational attainment extraction

Distribution of migrants by educational attainment, Armenia 2017
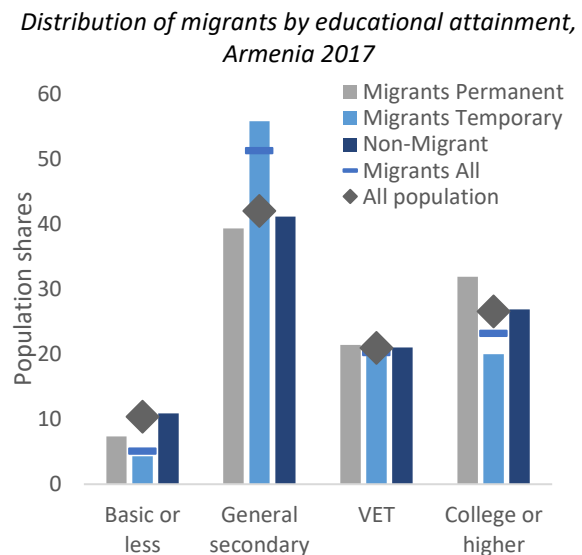
Source: Own elaboration based on 2017 RAU survey

Only a minor share of international migrants come from households in Yerevan, with temporary migrants more likely to come from rural areas and permanent migrants more likely to come from secondary cities. The distribution of the origin households from where the international migrants come from does not track the actual population distribution (Figure 5). The city of Yerevan is the region from where international migrants are less likely to come from, both temporary and permanent. Close to half of temporary migrants come from rural areas in the country and only 15 percent of them come from Yerevan. In contrast, close to 50 percent of permanent migrants come from the cities outside Yerevan, and only 25 percent from Yerevan. The fact that most of international migrants are from outside Yerevan could be related to the fact that Yerevan receives a large proportion of internal migration, and

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consequently only those who are not able to find better economic prospects in the capital decide to migrate outside the country.

International migrants were in a precarious position in the labor market before leaving Armenia. Both temporary and permanent migrants were mostly either unemployed or inactive in the labor markets before leaving the country (Figure 6). In the case of temporary migrants, 70 percent of them were in that situation, while for permanent migrants this share was 57 percent. These rates are considerably higher than what is reported for the non-migrant population. For them, at the moment of the interview, only 18 percent were either unemployed or inactive. The share of international migrants who were employed just before departure is also lower than what it is for the non-migrant population at the present. While for

Figure 5: Temporary migrants are more likely to come from rural areas and permanent migrants from secondary cities

Distribution of international migrants by location of origin, Armenia 2017

Source: Own elaboration based on 2017 RAU survey

migrants this share is close to 25 percent, for the non-migrant population is around 40 percent. The migrants' labor force status is actually strongly correlated with the decision to migrate as, keeping everything else constant, being unemployed or inactive before departure is associate with 20 percent higher probabilities of migrating (Figure 7). This effect persists even after controlling by sociodemographic characteristics, educational level, perceptions of wellbeing and the location in the country.

Figure 6: Most migrants were either unemployed or inactive before leaving the country

Distribution of migrants by labor force status before departure, Armenia 2017
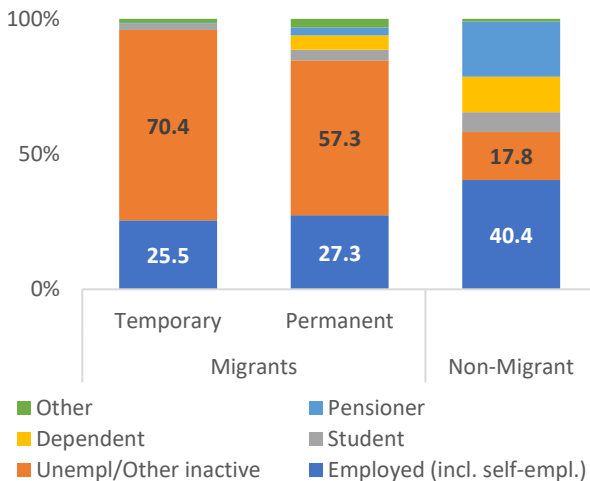
Note: For non-migrant population labor force status refers to moment of the interview (2017).
Source: Own elaboration based on 2017 RAU survey

Figure 7: Migrants' labor force status is strongly correlated with the decision to migrate

Marginal Probabilities of Migrating by Labor Force Status before Departure, Armenia 2017
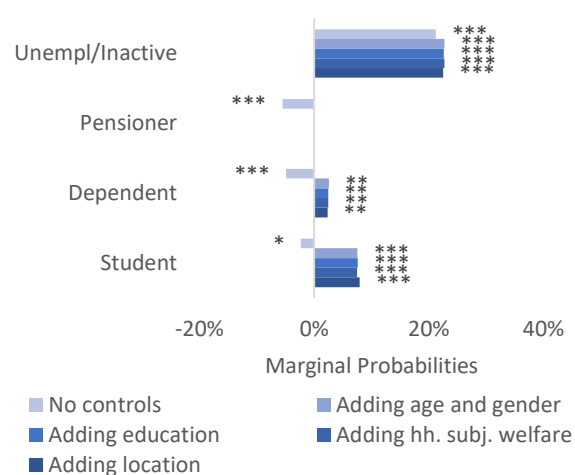
Note: Estimates based on OLS regressions. Only 15+ age old population. For non-migrant population, 2017 labor force status is used.
Source: Own elaboration based on 2017 RAU survey

International migrants' employment prospects at their destinations are considerably more favorable.
Close to 90 percent of temporary migrants and close to two thirds of permanent migrants are employed
at their destination, shares considerably higher than for the non-migrant population in Armenia for which
this share is 40 percent. Among the temporary migrants barely 5 percent are unemployed or inactive. For
the permanent migrants, in contrast, the share of unemployed or inactive is similar to what is observed
in the Armenian labor market, at 18 percent.

Figure 8: International migrants' employment prospects at their destinations outside Armenia are considerably more favorable.

Distribution of international migrants from Armenia by labor force status at their destination, 2017
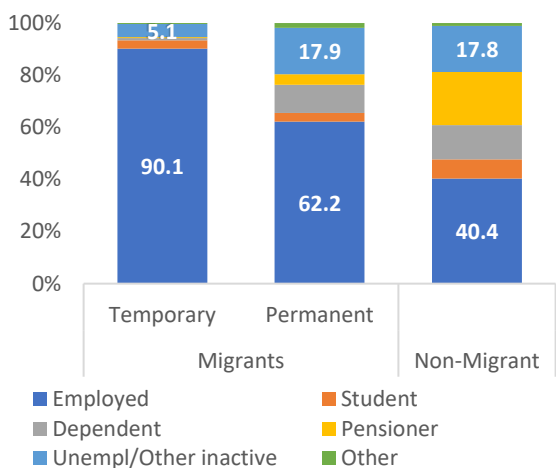
Note: Exclude migrants in Armenia at the moment of the interview. Only 15+ years old.
Source: Own elaboration based on 2017 RAU survey

Figure 9: The most prevalent form of employment for Armenia international migrants is as employees in local firms.

Distribution of employed international migrants from Armenia by form of employment, 2017
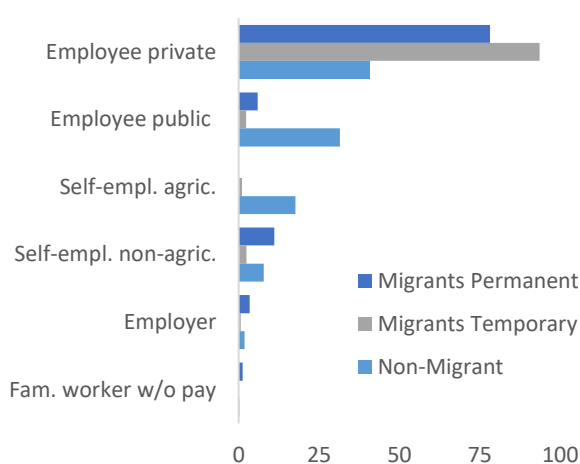
Note: Only employed workers and 15+ years old.
Source: Own elaboration based on 2017 RAU survey

International migrants' employment is largely in the form of hired workers in enterprises at their destinations, mainly in the construction and trade and repair services sectors. The vast majority of Armenian international workers that find a job at their destination countries does so as employees in the private sector (78 percent for permanent migrants and 94 percent for temporary ones). Only 11 percent of employed permanent migrants report working as self-employed on the agricultural sector. In terms of the sectors where these workers land, the vast majority of temporary workers are hired in the construction sector (71 percent). The rest are divided between trade and repair, manufacturing and other industries. For the permanent migrants the distribution is more even, though still construction plays the most prominent role, in part reflecting the higher educational attainment that this group has with respect to the temporary migrants. The agricultural sector, which is responsible for close to 19 percent of the employment among non-migrants, has almost no presence as an employer in the destination countries for the Armenian emigrants.

The Russian Federation is the main country of destination, by far, for Armenian migrant workers. Close to 80 percent of permanent migrants and over 95 percent of temporary migrants aim at the Russian Federation as their destination country. Cultural ties stemming from a common past as part of the Soviet Union plays a role when workers decide for a destination. In addition, the visa-free regime with Russia,

large migrant networks, cheap transportation costs and Armenians' knowledge of the Russian language are all facilitating factors for migration to that country (Calenda 2014).

Figure 10: Construction and trade and repair services sectors are the most important employers for Armenian international migrants
Distribution of employed international migrants from Armenia by sector of employment, 2017
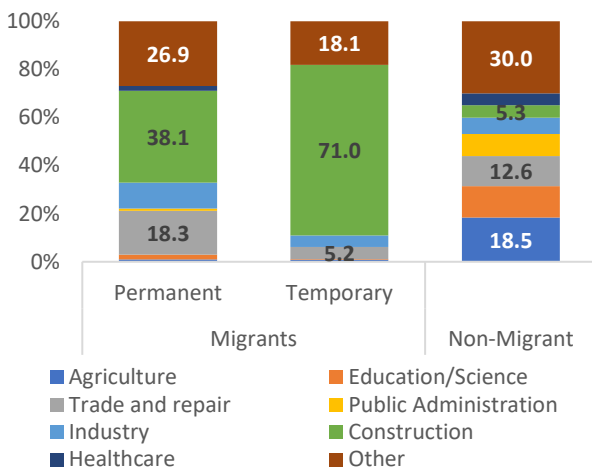
Figure 11: Most Armenian international migrants aim for the Russian Federation as their destination country
Distribution of international migrants from Armenia by country of destiny, 2017

Source: Own elaboration based on 2017 RAU survey
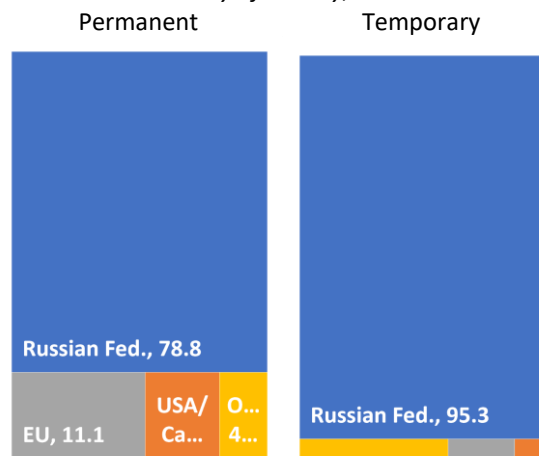
Source: Own elaboration based on 2017 RAU survey

3.2. Origin Households

The perceived wellbeing of households with international migrants is roughly similar with that of households without international migrants. Although the RAU survey does not collect information on consumption or income that could be used to create an objective measure of welfare, it does collect information on subjective welfare. This information is collected as self-reported perceived financial status, broken into four groups (Figure 12). Regardless of their migration status, most households report themselves as belonging to the Moderate category. Otherwise, the distributions of households with permanent and household with temporary migrants tracks closely that of households without migrants, with only small over-representations of permanent migrants for the Moderate category and of temporary migrants for the Very Bad category.

International migrants contribute to over 40 percent of incomes to their households in Armenia. Income sources for households with and without migrants differ markedly. For both households with permanent migrants and with temporary migrants, remittances sent from abroad represent more than 40 percent of their income. The second most important source of income are salaries that represent close to 25 percent, then followed by pensions and agricultural income. For households without members living abroad, the income coming from salaries represents a much larger share, close to 50 percent. This is followed by pensions and agricultural income. There are no considerable differences between the households with permanent and temporary migrants in the profile of their income sources.

Figure 12: The subjective well-being of households with international migrants does not differ widely than those without
Distribution of households with international migrants by subjective financial situation, Armenia 2017
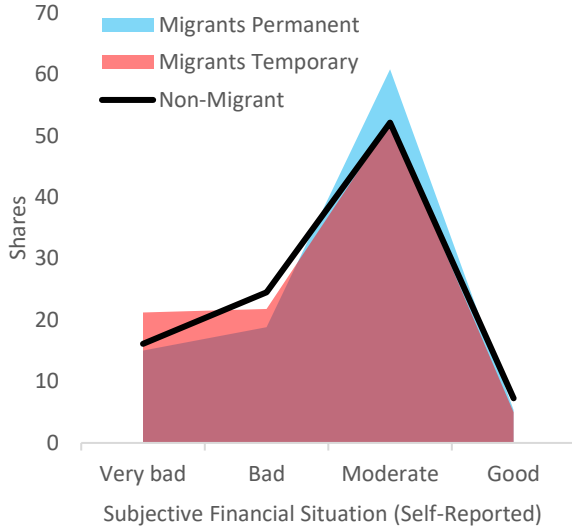
Note: Very Good category is reported jointly with Good due to a small number of observations.
Source: Own elaboration based on 2017 RAU survey

Figure 13: International migrants contribute substantially to their households' budget in Armenia.
Households Sources of income, Armenia 2017
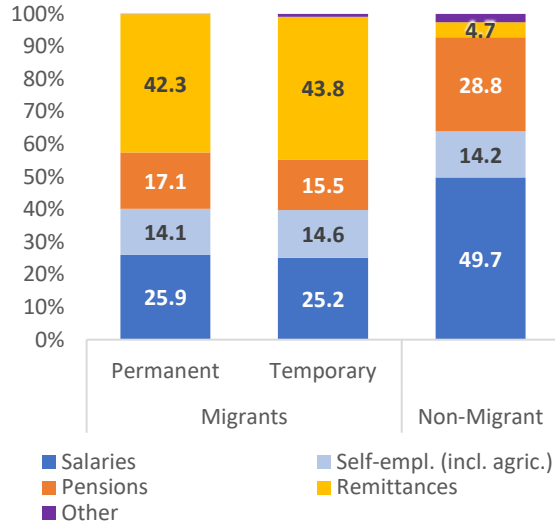
Source: Own elaboration based on 2017 RAU survey

Figure 14: Temporary migrants' households tend to spend the remittances received more in food and clothes than permanent migrants' households, consistent with lower levels of welfare
Distribution of spending categories for remittances received, Armenia 2017
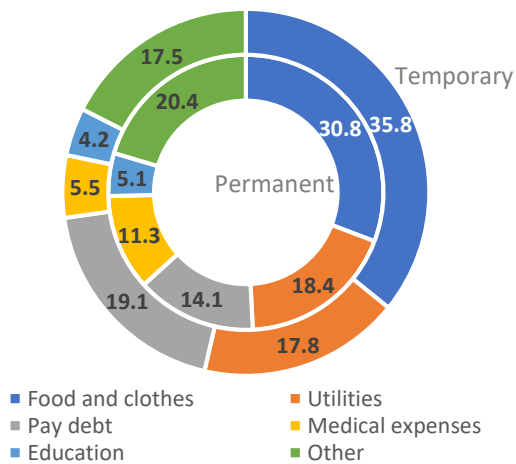
Note: Includes households with a migrant.
Source: Own elaboration based on 2017 RAU survey

Remittances are spent in a roughly similar manner on households with temporary and permanent migrants, although temporary migrants' households tend to spend more in food and clothes, consistent with lower levels of welfare. The largest expenses for the remittances received in households with international migrants is food and clothes, for which close to a third of the remittances received is dedicated (Figure 14). Households with temporary migrants spend more on these items, signaling their possible lower levels of welfare. These differences are more noticeable in Yerevan and rural areas, where these households spend close to 40 and 35 percent of the remittances in food and clothes, as opposed to 30 and 25 percent, respectively, spent by households with permanent migrants. Paying utilities and heating, and re-paying debts are the following most important expenses. In the case of re-paying debts, households with temporary migrant tend to dedicate more resources to this

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expense, especially in Yerevan (8 percent vs 2 percent for permanent) and rural areas (25 percent vs 20 percent), signaling higher financial constrains to afford international travelling, and in line with their suggested lower levels of welfare.

Box 1: Are international migrants identified in the RAU and ILCS surveys the same?

Given the different sampling frames and wording for questions to identify international migrants between the two surveys, a comparison of socio-demographic characteristic was conducted. The ILCS does not allow to separate by permanent or temporary status of migration, so the comparison of migrants between the two surveys had to be conducted for the entire international migrants group. The number of international migrants in the ILCS is close 225,000 people, below the 250,000 international migrants identified in the RAU survey, but still within the same order of magnitude.

Table B1: Socioeconomic characteristics of international migrants identified in the RAU and ILCS surveys are roughly consistent

	ILCS	RAU	T-test on means difference	
Gender				
Male	80.3	83.7	-2.06	**
Average age	37.4	37.8	-0.72	
Age structure				
0-14	4.6	4.8	-0.23	
15-29	33.1	25.0	4.17	***
30-49	36.5	47.0	-4.81	***
50-64	20.1	20.6	-0.30	
65+	5.7	2.6	3.96	***
Education level, ages 15+				
Basic school	6.5	5.1	1.39	
General secondary	56.9	51.4	2.46	**
Pre-vocational and professional	19.8	20.3	-0.26	
College and higher	16.8	23.2	-3.48	***
Geographic location				
Yerevan	20.4	20.0	0.18	
Other urban	31.5	38.0	-3.04	***
Rural	48.1	42.0	2.80	**
Observations	2,288	665		

Source: Own elaboration based on 2017 ILCS and 2017 RAU survey.

Socio-demographic characteristics follow similar patterns in the groups identified as international migrants in each survey, albeit the ILCS sample is younger, less educated and more rural. Both surveys represent a similar proportion of male and female migrants. However, the age distribution in both surveys presents some differences. Both surveys account for the same proportion of migrant children aged 0-14 years old and migrants aged 50-64 years old. On the other hand, the ILCS accounts for a larger proportion of migrants aged 15-29 and a smaller share of migrants 30-49 years. Regarding the distribution of educational attainment, the ILCS captures a larger proportion of migrants with general secondary education, while the RAU survey accounts for a higher proportion of migrants with college or higher levels of education. These findings impose a methodological caveat on the analysis, especially on the external validity of the results obtained with the current approach.

According to the 2017 ILCS, households with international migrants are roughly evenly distributed along the consumption distribution. Close to 20 percent of households report having a member identified as international migrant in the 2017 ILCS. This share is slightly below to the 25 percent reported in the RAU survey, although consistent with the lower number of international migrants captured. Migrant households are almost equally distributed across the consumption distribution, although the proportion of migrant households among the top three deciles is slightly higher -around 20-23 percent- compared to the proportion of migrant households in the bottom three deciles of the consumption distribution -around 15-21 percent- (Figure 15). While this distribution captures the welfare status of households after the migration decisions are made (an effort to simulate positions ex-ante is presented in the next section), it is quite illustrative of the fact that international migrants do not come only from the bottom of the distribution but are widely distributed along the entire distribution. By geographical areas, the proportion of migrant households is higher in rural areas than in urban areas. Indeed, in rural areas, 28 percent of households have at least one migrant member, followed by urban areas other than the capital, where the percentage of households with at least one migrant member equals the national level (20 percent). In Yerevan, only 12 percent of households have at least one migrant member.

Figure 15: Households with an international migrant member are roughly evenly distributed across income levels

Share of households with an international migrant by deciles, Armenia 2017
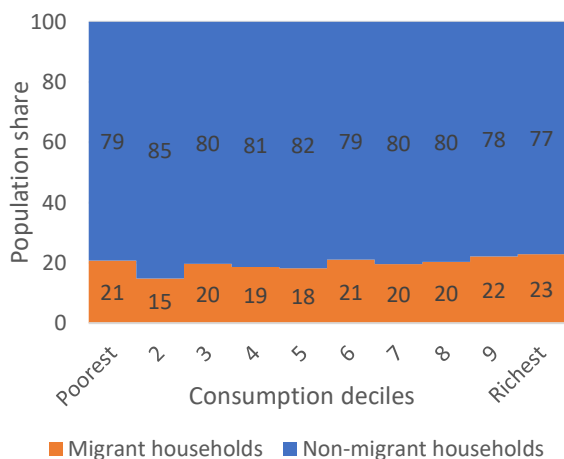
Source: Own elaboration based on 2017 ILCS

Figure 16: Remittances play an important role to as a source of income across all income levels

Income sources for households with an international migrant by deciles, Armenia 2017
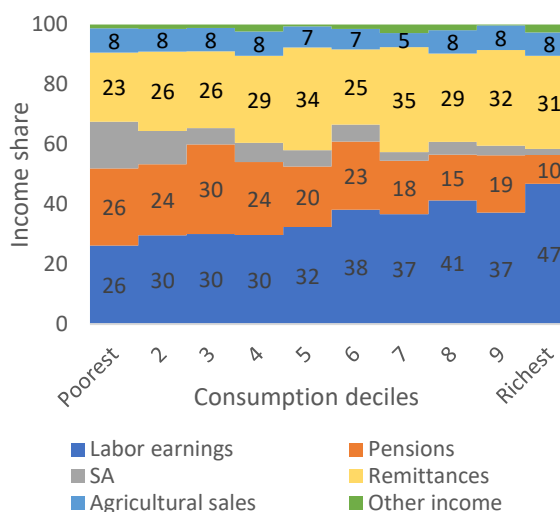
Source: Own elaboration based on 2017 ILCS

Remittances play an important role as a source of income among households with migrants across all deciles of the consumption distribution, according to the 2017 ILCS. In line with the presence of international migrants across all welfare levels, according to the 2017 ILCS, remittances also play an important role to support income across all deciles (Figure 16). Remittances account for nearly 30 percent of migrant households' total income. This figure is even higher for migrant households in the middle part of the consumption distribution, where the remittances represent more than one-third of total household income. Thus, policies that aiming at influencing the flow of remittances, as well as slowdowns in destination countries affect households along the entire income distribution.

4. Armenian Households' Welfare and Migration

Remittances sent by international migrants can have important impacts on the distribution of household income and welfare. In the context of developing countries like Armenia, where they represent close to 30 percent of income for the recipient households, international migration of family members can provide a major role in supporting household's income. Micro-economic evidence based on household survey data suggests that remittances are generally associated with reductions in poverty; however, they may increase or decrease inequality depending on the position of remittance-receiving households in the income distribution and the magnitude of remittances with respect to other income sources (Adams, 1991; Adams, 2006; Stark et al., 1986; Barham and Boucher, 1998; Acosta et al., 2008).

Figure 17: Households with an international migrant member display lower levels of poverty
Poverty headcount by households' migrant status and area of residency, Armenia 2017
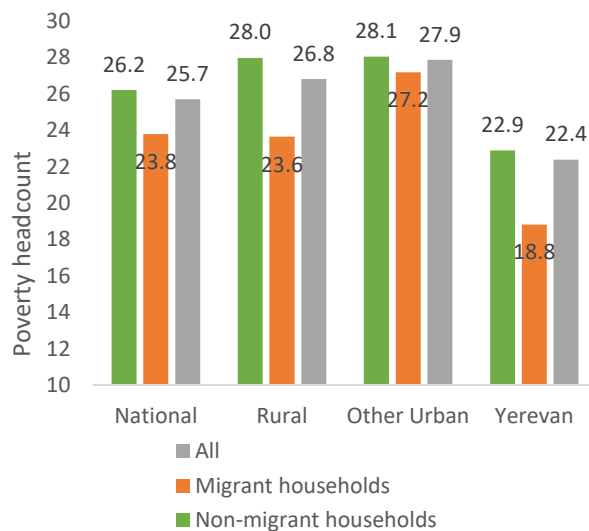
Source: Own elaboration based on 2017 ILCS

The poverty rate among households with an international migrant is lower than for households with all their members living in the country. The national poverty headcount rate in Armenia is based on consumption per adult equivalent. The poverty headcount rate in Armenia has declined over time, but still more than a quarter of the Armenian population live in poverty (25.7 percent in 2017). Poverty rate is higher in urban areas other than Yerevan, followed closely by rural areas. The poverty rate among households with migrants is lower than for households without. This is consistent across all geographic areas but is more marked in Yerevan and rural areas (Figure 17). This evidence suggests that remittances in the case of Armenia seem to have a strong poverty-reduction effect, and that international migration works as an effective anti-poverty strategy.

To understand better the impacts of international migration on household's welfare through remittances we recreate counterfactual scenarios without international migration and remittances. The assessment of the impact of remittances on poverty and inequality requires different methodological assumptions regarding the treatment of remittances. Indeed, remittances can be considered as an exogenous transfer of income by migrants (Stark, 1991; Stark et al., 1986; Stark et al., 1988), or, alternatively, as a potential substitute for home earnings (Barham and Boucher, 1998; Zhu and Luo, 2010; Acosta et al., 2008). On the one hand, the assumption that remittances operate as exogenous transfers implies a simple counterfactual scenario where the amount of remittances sent by current migrants is set to zero. On the other hand, the assumption that remittances operate as a potential substitute for home earnings requires estimating the counterfactual individual earnings that current migrants would have earned had they not migrated. In this report, we consider both scenarios.

4.1 Remittances as exogenous transfers

Poverty headcount for the total population jumps from 25.7 to 30.9 percent in a scenario without remittances. To measure the impact of remittances on poverty and inequality when considering

remittances as exogenous transfers, remittances are set to zero (Table 1). Since our poverty and inequality measures are based on the household's consumption, the household income without remittances need to be converted into consumption. For this purpose, we assume that the consumption to income ratio remains the same and households continue to consume the same proportion of their income as in the baseline scenario. When subtracting remittances from total household income, the consumption distribution is shifted to the left (Figure 18). Furthermore, there is 1.7 percent of households who depend exclusively on income from remittances, and therefore, whose consumption drop to zero. Poverty headcount rate for the total population jumps from 25.7 to 30.9 percent (an increase of more than 5 percentage points) in the scenario without remittances. Inequality also increases without remittances-- the Gini coefficient rises from 28.9 to 30.5 points and the p90/p10 ratio rises from 2.8 to 3.1. Besides, the poverty rate among individuals living in migrant households dramatically increases by 25.1 percentage points and the Gini coefficient by 7.1 percentage points. Further, the p90/p50 and p50/p10 ratios for migrant households show that the increase in inequality is mainly driven by the lower tail of the distribution getting longer, namely, poor households becoming much poorer. This scenario does not take into account the fact that migration also entails losses of income associated with migrants' absence from their communities--migrants could also be contributing to their families if they had stayed at home. To address this issue, the following analysis considers remittances as a potential substitute for home earnings.

Figure 18: Removing remittances from households' income affect the entire consumption distribution

Household consumption distribution with and without remittances, Armenia 2017
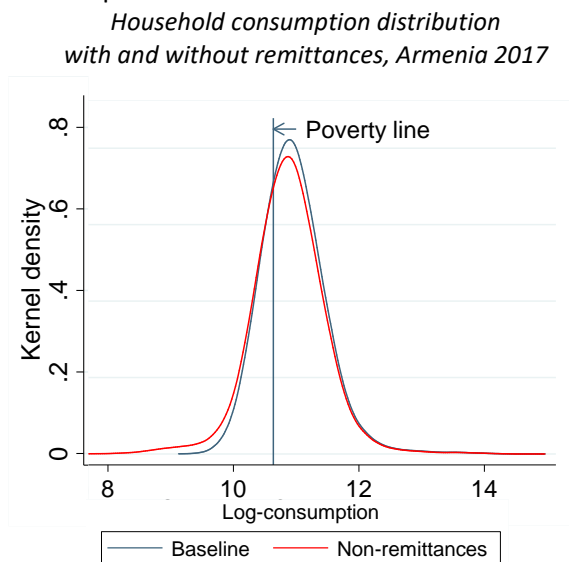
Note: Baseline refers to observed scenario. All households included.
Source: Own elaboration based on 2017 ILCS

Figure 19: …with losses between 4 and 6 percent of consumption for all quintiles

Average household consumption with and without remittances by quintiles, Armenia 2017
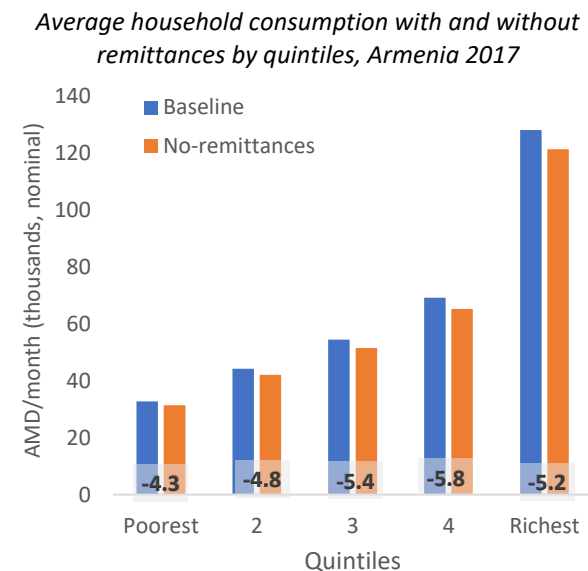
Note: Baseline refers to observed scenario. All households included. Numbers in columns base indicate change in household consumption when remittances are removed.
Source: Own elaboration based on 2017 ILCS

Table 1: Poverty and Inequality indicators with and without remittances, Armenia 2017

	Baseline scenario			Remittances as exogenous transfers		
	All	Migrant households	Non-migrant households	All	Migrant households	Non-migrant households
Poverty	25.7	23.8	26.2	30.9	48.9	26.2
Gini	28.9	28.4	29.0	30.5	35.5	29.0
p90/p10	2.8	3.0	2.8	3.1	5.0	2.8
p90/p50	1.8	1.8	1.8	1.8	2.0	1.8
P50/p10	1.6	1.7	1.6	1.7	2.6	1.6

Note: P90/P10 is the ratio of the upper bound value of the ninth decile (i.e. the 10% of people with highest consumption) to that of the first decile. P90/P50 of the upper bound value of the ninth decile to the median. P50/p10 is the ratio of the median to the upper bound of the first decile.

4.2 Remittances as a substitute for home earnings

The treatment of remittances as a substitute for home earnings requires predicting what migrants would have earned if they had not left the country, accounting for possible self-selection biases in migration and employment decisions. For this, it is necessary to construct individual earnings estimates for current migrants in the counterfactual scenario of non-remittances and non-migration. This approach, however, does not account for the fact that employment decisions and labor earnings of other family members may be affected, as well as the composition of social benefits that households may receive. Further research could be done to address also these issues, which are beyond the scope of this study. In any case, a possible approach for predicting earnings is to assume that the sub-sample of non-migrants is a random draw from the population**.** Under this assumption, labor earnings for migrants can be predicted using the parameter estimates of an earnings equation for the sub-sample of non-migrants who are employed. However, with this approach the regression's coefficients are likely to suffer from selection bias, which may potentially arise from two sources. First, since individuals can decide whether to migrate or not, migrants and non-migrants may differ systematically in their observable and unobservable characteristics (e.g. ability, motivation, etc.), and therefore the migration decision and individual's labor earnings are likely to be correlated. This implies that the assumption that non-migrants are drawn randomly from the population may not be valid. Secondly, individuals can also decide whether to work or not, and therefore the sub-sample of non-migrants who work may also be non-randomly selected from the population.

Migration and employment decisions are modeled using socio-demographic characteristics and households' assets, and most of the coefficients show the expected signs. The estimation results of the bivariate probit, run separately for men and women, are displayed in Annex A, Table A14. To model the propensity to work, we include as explanatory factors socio-demographic characteristics, such as marital status, age, age squared, educational attainment, dummy indicating if individual is enrolled in education, number of children in the household, number of other employed members, relationship to the household head, and geographic location; living condition variables, and household's assets holdings. The propensity to not migrate is modeled using almost the same variables plus the exclusion restriction accounting for the presence of migrant networks. The exclusion restrictions have the expected effects on both the probability to work and not migrate. The dummy variable indicating whether the individual is enrolled in education is negatively correlated with the probability to work and statistically significant at 1% level. In

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addition, the presence of young children in the household decrease the probability to work and increase the probability to not migrate. The coefficients are statistically significant only for women, reflecting the fact that women are the ones who are mainly responsible for child-rearing. Our proxy for the presence of migration networks in the area of residency is positively correlated with the probability to migrate and statistically significant at 1% level, suggesting that the access to migration networks is fundamental for the migration choice (see Annex A, Table A15).

Earnings are modeled using socio-demographic characteristics and statistics from the migration and employment decisions models, with statistical results indicating the sub-sample of non-migrants who work is not randomly selected from the population. The results of the OLS estimation of the earnings equation, both with and without the selection correction terms are shown in Annex A, Table A15. The two selection correction terms are highly correlated with earnings and both are statistically significant either for women or men. This suggests that the sub-sample of non-migrant who work is not randomly selected from the population, and consequently, the parameters estimated via OLS without controlling for selection are biased.

The labor earnings model performs well predicting the values around the center of the distribution of earnings, although it is not as accurate for predicting values on the tails. To assess the predictive accuracy of our earnings equation, we compare the distribution of observed and predicted earnings for the sub-sample of non-migrant who work. While it is true that the model perform well predicting the mean and other percentiles of the distribution, it is not as accurate at predicting both extremes of the distribution. In fact, the predicted mean, median, percentiles 25th and 75th have mostly the same values that the observed (see Annex A, Table A16). However, percentile 10th is shifted to the right, while the percentile 90th is shifted to the left. Consequently, the predicted earnings for migrant in the counterfactual scenario of non-migration are likely to be overestimated at the lower part of the distribution and underestimated at the upper part of the distribution.

Figure 20: Predicted earnings for are more concentrated around the center of the distribution for women…

Actual and predicted log-earnings for non-migrant female workers, Armenia 2017
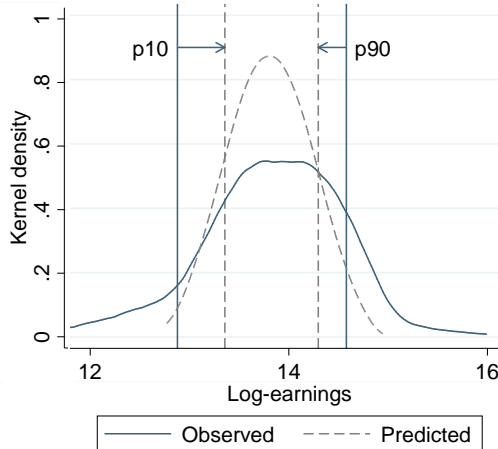
Source: Own elaboration based on 2017 ILCS

Figure 21: … and for men, while matching well the mean and 25th and 75th percentiles

Actual and predicted log-earnings for non-migrant male workers, Armenia 2017
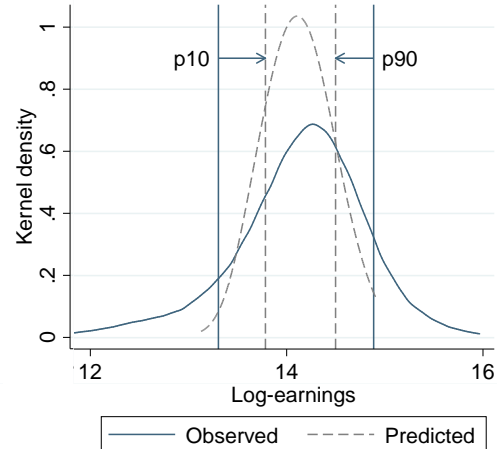
Source: Own elaboration based on 2017 ILCS

Based on these results, three counterfactual scenarios are estimated using different employment rates assumed for migrants who would have stayed in Armenia. To impute the value of earnings that migrants would have earned if they had not left the country, we consider different employment rates that migrants could attain in the counterfactual scenario of non-migration. For this purpose, we use information from the RAU survey and simulate three scenarios. From RAU survey we know that the employment rate (for 15 years old or older) among migrants before leaving the country is 26 percent and the employment rate among non-migrants is 40 percent (Figure 6). In the first scenario, we let the employment rate among migrants in the counterfactual scenario of non-migration continue to be the same they had before leaving the country (26 percent). This scenario represents a lower bound of what the labor earnings for the households with migrants would have been in absence of migration. In the second scenario, we choose an employment rate in between the employment rate among migrants before leaving and the employment rate among non-migrants (33 percent). This scenario is an intermediate one in which we try to account for the fact that before leaving the country migrants may have only small incentives to stay employed considering that they would knew of their upcoming travel and potential employment abroad, hence the low reported rate of employment may be an underestimation of their actual employment levels. Finally, in the third scenario, we allow the employment rate among migrants to be the same as the employment rate among non-migrants (40 percent). This scenario is an upper bound of what the labor earnings for the households with migrants would have been in absence of migration. It assumes that the employment prospects of the international migrants were like those that did not consider migrating.

We assume that the labor force participation and employment decisions of the household members who do not migrate do not change. We take this assumption given the additional complexity that modeling these decisions will entail, while recognizing that there is evidence of these impacts. Recent work by Paul (2018) analyzing data (using matching models) for the South Caucasus (including Armenia) suggests that the drop-in labor force participation among members of a migrant's household is about 25 percent on average and twice as high for households with permanent migrants compared to those with temporary migrants. Other recent analyses (World Bank, 2019c) suggest that having a migrant member increases the labor force participation of the members that stay.

Imputing predicted earnings under the different scenarios follows a three-step approach. First, to identify the migrants who would be employed in the counterfactual scenario of non-migration, we predict the probability to work for each migrant, using the unconditional probability to work from the bivariate probit previously estimated. Then, we calculate the probability thresholds that generate each of the three employment rates in our sample of migrants. Finally, we impute the predicted earnings only to those migrants that were classified as employed, using the OLS estimates accounting for self-selection biases.

We assume that migrant households not receiving remittances do not change their situation in the counterfactual scenario of non-migration. This group account for 47.2 percent of the total migrant households and 9.4 percent of the total households (these high rates could be driven in part by migrants bringing back home their earning with themselves or sending in-kind transfers. Alas, none of these cases can be properly accounted for in the questionnaire). We consider these households in the counter-factual as if they had absent members, same as in the baseline scenario, so their total household's per adult equivalent consumption is not affected. The rationale for leaving this groups aside from the counterfactual is that we are interested in calculating the poverty-reducing effect of remittances, and the treatment of these households with non-contributing members abroad is not straightforward. It may be the case that these members did not either contributed in Armenia (then overestimating their contribution by imputing

them earnings), or that they have formed now separated households abroad (then compounding the effect of remittances with the effect of new households forming). Given these difficulties, we opted in this study to leave this group aside (robustness checks presented below show that excluding this groups does not affect results significantly). In contrast, migrant households receiving remittances in the counterfactual scenario of non-migration are considered as if they had all their members living in the household and what each migrant member would contribute to the household had they not migrated will depend on the imputed income resulting from each simulated scenario.

Figure 22: Remittances have a clear poverty reducing effect…
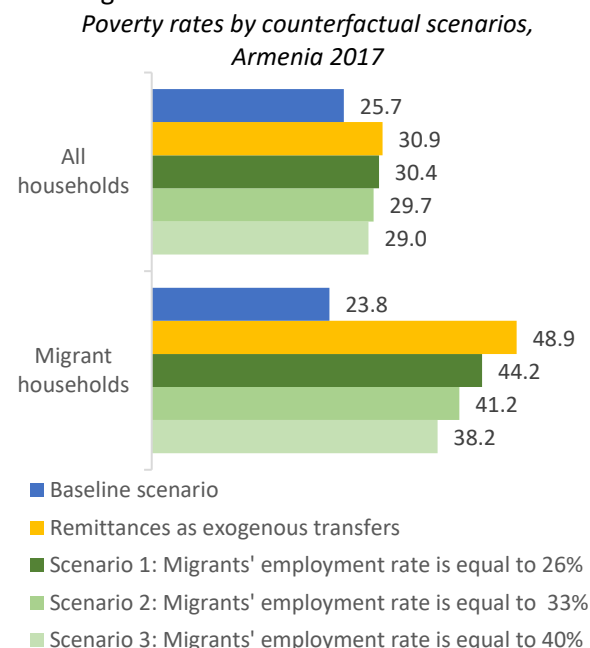
Poverty rates by counterfactual scenarios, Armenia 2017

Figure 23: … and also contribute to diminish inequality

Gini coefficients by counterfactual scenarios, Armenia 2017

Source: Own elaboration based on 2017 ILCS
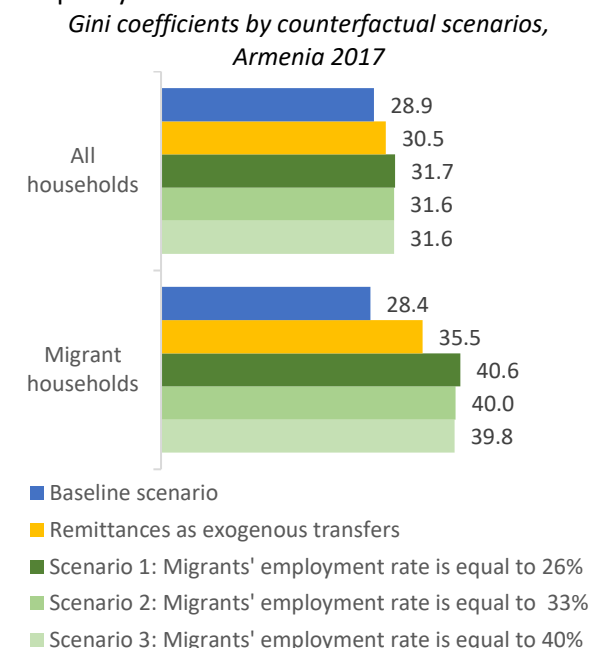
Source: Own elaboration based on 2017 ILCS

Table 2: Poverty and Inequality indicators under counterfactual scenarios to remittances, Armenia 2017

		Baseline scenario		Scenario 1: Migrants' employment rate before departure 26%		Scenario 2: Migrants' employment rate before departure 33%		Scenario 3: Migrants' employment rate before departure 40%	
		All hhs.	Migrant hhs.	All hhs.	Migrant hhs.	All hhs.	Migrant hhs.	All hhs.	Migrant hhs.
Poverty		25.7	23.8	30.4	44.2	29.7	41.2	29.0	38.2
Gini		28.9	28.4	31.7	40.6	31.6	40.0	31.6	39.8
p90/p10		2.8	3.0	3.2	5.6	3.1	5.5	3.1	5.5
p90/p50		1.8	1.8	1.8	2.1	1.8	2.1	1.8	2.2
p50/p10		1.6	1.7	1.7	2.6	1.7	2.6	1.7	2.5

Source: Own calculations based on 2017 ILCS

Results of the simulation indicate that outmigration indeed reduces both poverty and inequality in Armenia. The resulting poverty rates and inequality indexes in each simulated counterfactual scenario of non-migration are displayed in Table 2. In the first simulation (employment rate among migrants is equal

to 26%), the poverty rate obtained is 30.4 percent, almost 5 percentage points higher than the poverty rate in the baseline scenario--a figure very similar to the case in which remittances are treated as exogenous transfers-, and the Gini coefficient is 31.7 percent. In the second simulation (employment rate among migrants is equal to 33%) and in the third simulation (employment rate among migrants is equal to 40 percent), the poverty rates are lower than in the first simulation but still higher than the baseline scenario (29.7 percent and 29.0 percent, respectively) and the Gini coefficients in both cases are 31.6 percent. The p90/p10, p90/p50, and p50/p10 ratios suggest that the increase in inequality is mainly driven by the higher decline in consumption among the poorest migrant households than among the richest, since the p50/p10 ratio among migrant households is higher than the p90/p50 ratio (Table 2). It is worth pointing out that the Gini coefficients in the counterfactual scenarios of non-migration are also higher than the Gini coefficient in the scenario in which remittances are treated as exogenous transfers. This is related to the fact that migrants from richest households are more likely to have higher levels of education, and therefore they are more likely to be employed in the counterfactual scenario of non-migration than those coming from poorest households. This implies that labor earnings are more likely to be imputed to migrants from richest households and, consequently, richest migrant households are more likely to reach consumption levels close to the baseline scenario of migration and remittances, while poorest migrant households see their consumption levels decline dramatically in absence of migration (see Annex A, Table A19).

The gains in poverty reduction through remittances fluctuate between 3 and 5 percentage points. When remittances are treated as exogenous transfers, the poverty rate increases by 5.2 percentage points, and in our more optimistic scenario -counterfactual scenario of non -migration with migrants' employment rate equal to 40 percent- the poverty rate increases by 3.3 percentage points. These results suggest that the poverty reducing effect of remittances ranges between 3.3-5.2 percentage points. The gains in inequality are lower than in poverty but still significant, fluctuating between 1.6-2.8 percentage points.

Two additional simulations carried out as robustness check confirm the stability of the estimates. In the first one, migrant members of households not receiving remittances are assumed as if they had not migrated, but they continue to not contribute to the household. This case produces very similar figures to the case displayed above. In the second one, migrant members of households not receiving remittances are assumed as if they had not migrated and labor earnings are imputed for those who are classified as employed in each of counterfactual scenario of non-migration. The resulting poverty rates and inequality indexes for each case can be found in Annex A, Table A17 and Table A18, respectively.

5. Policy implications

Migration in Armenia has become a powerful element with the potential to contribute to the country's continuous economic development. The large size of the diaspora and the country's high dependency on remittances make of Armenia a good candidate to implement policy actions for leveraging remittances for development. The results of this report shed light on the positive impacts of remittances on poverty and inequality in the country, as well as on the differences in the profile of temporary and permanent international migrants. These findings can help to inform potential future policies actions to harnessing the remittances potential for the country's development and complement the rich set of policy recommendations outlined in World Bank (2019c, Armenia: Better Understanding International Labor Mobility) proposed from a jobs and productivity angle.

Regarding temporary migration, policy efforts should be focus on removing potential restrictions low-skilled emigrants may face along with helping the reintegration of returnees. Most of the migrants in Armenia are temporary migrants. As this report has shown, temporary migrants tend to be less educated and to work in low-skilled sectors of the economy. Besides, around 70 percent of temporary migrants were either unemployed or inactive in the labor market before leaving the country. Low-skilled emigration not only has the potential to increase labor earnings and reduce unemployment of poor workers in the country of origin, but also it may improve the skills of the returning workers. However, many of the poorest lack the financial resources for successful emigration, which in many instances can be the only feasible alternative households may have to escape poverty. Temporary migrants often must rely on bilateral or regional agreements, such as the seasonal work and programs between countries in the Eurasian Economic Union. The development of migration polices designed jointly by origin and destination countries that grant more opportunities for temporary migration, facilitate the emigration process, and reduce the financial costs associated to temporary migration could significantly help more poor households escape poverty, in absence of better opportunities in the short term for employment in the country.

Regarding permanent migration, policy efforts should be concentrated on fostering the transfer of knowledge and skills from destination countries to Armenia. Permanent migrants in Armenia tend to have higher levels of education even higher than non-migrants and the average of the population. The main benefit of high-skilled emigration is the creation of a large, well-educated diaspora, that can facilitate the transfer of knowledge between destination and origin countries. In fact, a well-educated diaspora can improve access to capital, technology, information, foreign exchange, and business contacts for firms in the country of origin. According to other studies, immigrants play a role in facilitating trade by providing information and helping to enforce contracts (Rauch and Trindade, 1999) and by acting as intermediaries that can match buyers with reliable local suppliers (Yusuf, 2001). Johnson and Sedaca (2004) emphasize that diasporas can act as "first movers" who catalyze growth opportunities and make connections between markets that otherwise would not exist. Consequently, it is important the development of policies that help maintain ties to the diaspora such as supporting professional networks, promoting dialogue between governments in the destination and Armenia, and funding educational, linguistic, and cultural programs.

There are also a number of policies actions that could benefit both types of migrant. Policy actions that could benefit both sets of workers include facilitating access to jobs abroad for Armenian workers across skill levels, ensure formal status for workers, diversify host countries to reduce risks, improve the matching of workers to jobs, and promote the more rapid integration of workers in the host country labor market (some of which could be through investments made by the host countries themselves), etc. Many of these programs are potentially mutually beneficial, such as Bilateral Labor Arrangements (BLAs) (Cho et al 2018) or Mutual Recognition Agreements (MRA) (Sumption et al 2013). MRAs, for example, improves the matching of jobs to workers, promotes more rapid integration (as worker credentials become more easily transferable) and enables the host country firms to find the best workers. Other options are Global Skill Partnerships (GSP), an arrangement whereby a host country government invests in the education of migrant workers prior to deployment (e.g. Germany investing in nursing schools in Eastern Europe to make sure there are enough German-speaking foreign nurses able to serve in the German health care industry) promotes education in the country of origin while ensuring that migrant workers have the right technical

training and language skills. MRAs and GSPs also can have an impact on diversifying the destination countries for the Armenian migrants, currently heavily concentrated in the Russian Federation.

Given the development impact of remittances, policy efforts should be also centered on steering the use of remittances for investments in human capital or physical assets and small businesses. As shown through this report, migrant households are highly dependent on remittances, which account for nearly 30 percent of migrant household's total income. In addition, the poverty reducing effect of remittances ranges between 3.3-5.2 percentage points for the all population and between 14.4-20.4 percentage points for individuals living in migrant households, even when considering more realistic counterfactual scenarios. This large impact of remittances on household budgets, however, leads to increases in consumption of non-durable goods and debts payments, but only small shares of the remittances are dedicated to investments in education or productive activities in the household. The share of remittances spent in education hovers between 4 and 5 percent, and the share spent on investments in origin households' farms oscillates only between 1 and 2 percent. Other forms of investment are negligible. While this pattern may be the result of receiving households being financially constrained and facing difficulties to make ends meet, schemes like matching contributions or tax rebates may induce households to invest some of these funds into more productive uses, with potential multiplying effects positive for economic development.

To mitigate the negative effects of international migration in the local economy, policy actions should tackle youth unemployment and reintegration of high-skilled returnees. While it is true that international migration can bring important benefits to the country's development, there are also some negative impacts in the local economy that need to be mitigated, such as the rapid population decline and the aging of the Armenian population (World Bank, 2019b), as well as the loss of key human capital in the case of high-skilled emigration. According to RAU data, a quarter of the international migrants in Armenia are aged 15-29 years old which might be the result of the high unemployment levels among the youth. Policies that create employment opportunities for the young people in Armenia, especially in rural and urban areas other than the capital (for instance, financial support for the development of startups) can play a critical role to slow down the flow of outmigrants, reducing the negative effects of international migration. On the other hand, the negative effects of the brain drain could be tackled with policies that encourage educated emigrants to return by identifying job opportunities, cooperating with destination countries that have programs to promote return, permitting dual nationality, and helping to facilitate the portability of social insurance benefits (World Bank, 2006).

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Annex A

Table A1. Distribution of individuals and households by migration status, Armenia 2017.

Demographic group	Migrants			Non-Migrants	Population
	All	Permanent	Temporary		
International migrants	7.7	2.4	5.4	92.3	3,165,546
Households w/migrant mem.	24.5	6.2	18.3	75.5	777,939

Source: Own elaboration based on 2017 RAU survey

Table A2. Distribution of migrants by age groups, Armenia 2017.

Age group	Migrants			Non-Migrants	All
	All	Permanent	Temporary		
0-9	3.0	9.2	0.2	13.4	12.6
10-19	3.3	8.9	0.9	11.5	10.9
20-29	23.5	25.1	22.8	15.3	15.9
30-39	28.1	27.5	28.4	14.3	15.4
40-49	18.9	16.8	19.9	10.6	11.2
50-59	17.0	5.7	22.0	14.1	14.3
60-69	5.4	5.0	5.6	11.4	10.9
70-79	0.6	1.4	0.2	5.5	5.1
80+	0.1	0.5	0.0	3.9	3.6

Source: Own elaboration based on 2017 RAU survey

Table A3. Distribution of migrants by educational attainment, Armenia 2017.

Education	Migrants			Non-Migrants	All
	All	Permanent	Temporary		
Basic or less	5.1	7.3	4.3	10.9	10.4
General secondary	51.4	39.3	55.8	41.1	42.1
VET	20.3	21.4	19.9	21.0	21.0
College or higher	23.2	31.9	20.0	26.9	26.6

Source: Own elaboration based on 2017 RAU survey

Table A4. Distribution of migrants by location of origin, Armenia 2017.

Location	Migrants			Non-Migrants	All
	All	Permanent	Temporary		
Yerevan	20.1	25.5	17.7	35.4	34.2
Other urban	38.0	43.2	35.7	29.0	29.7
Rural	42.0	31.3	46.7	35.6	36.1

Source: Own elaboration based on 2017 RAU survey

Table A5. Distribution of migrants by labor force status before departure, Armenia 2017.

Labor Force Status	Migrants			Non-Migrants	All
	All	Permanent	Temporary		
Employed (inc. self-employment)	70.0	52.7	77.6	32.4	35.3
Unemployed / Other inactive	16.1	15.1	16.5	14.3	14.4
Dependent	5.2	13.5	1.6	19.7	18.6
Student	6.3	13.7	3.0	16.5	15.7
Pensioner	1.7	3.4	0.9	16.2	15.1
Other	0.8	1.5	0.5	0.9	0.8

Source: Own elaboration based on 2017 RAU survey

Table A6. Distribution of migrants by labor force status at their destination, Armenia 2017.

Labor Force Status	Migrants			Non-Migrants	All
	All	Permanent	Temporary		
Employed (inc. self-employment)	80.7	62.2	90.1	40.4	43.4
Student	3.3	3.3	3.2	7.4	7.0
Dependent	4.2	10.8	0.9	13.1	12.5
Pensioner	1.6	4.1	0.3	20.3	18.9
Unemployed / Other inactive	9.4	17.9	5.1	17.8	17.2
Other	0.8	1.8	0.3	1.1	1.1

Source: Own elaboration based on 2017 RAU survey

Table A7. Distribution of employed migrants by form of employment, Armenia 2017.

Form of Employment	Migrants			Non-Migrant	All
	All	Permanent	Temporary		
Employee private	89.7	78.2	93.7	40.9	47.6
Employee public	3.2	6.0	2.3	31.5	27.7
Self-employment agric.	0.8	0.0	1.0	17.7	15.4
Self-employment non-agric.	4.6	11.1	2.4	7.9	7.4
Employer	1.3	3.5	0.6	1.8	1.7
Fam. worker w/o pay	0.3	1.3	0.0	0.2	0.2

Source: Own elaboration based on 2017 RAU survey

Table A8. Distribution of employed migrants by sector of employment, Armenia 2017.

Sector of Employment	Migrants			Non-Migrant	All
	All	Permanent	Temporary		
Agriculture	0.8	1.0	0.8	18.5	16.0
Education/Science	0.7	1.9	0.3	12.9	11.3
Trade and repair	8.5	18.3	5.2	12.6	12.1
Public Administration	0.2	1.0	0.0	9.2	7.9
Industry	6.3	10.8	4.7	6.7	6.6
Construction	62.6	38.1	71.0	5.3	13.1
Healthcare	0.5	2.0	0.0	4.9	4.3
Other	20.3	26.9	18.1	30.0	28.7

Source: Own elaboration based on 2017 RAU survey

Table A9. Distribution of migrants by country of destination, Armenia 2017.

Country	Temporary	Permanent	All
Russian Fed.	95.3	78.8	90.3
USA/Canada	0.6	6.2	2.3
EU	1.3	11.1	4.3
Other	2.8	4.0	3.2

Source: Own elaboration based on 2017 RAU survey

Table A10. Distribution of households with international migrants by subjective financial situation, Armenia 2017.

Financial situation	Migrants			Non-Migrant	All
	All	Permanent	Seasonal		
Very good	0.1	0.0	0.2	0.5	0.5
Good	5.4	6.2	4.6	6.1	6.0
Moderate	56.1	59.6	52.2	55.2	55.1
Bad	19.9	18.0	22.1	22.7	22.6
Very bad	18.4	16.2	20.9	15.5	15.8

Source: Own elaboration based on 2017 RAU survey

Table A11. Distribution of household sources of income, Armenia 2017.

Sources of income	Migrants			Non-Migrant	All
	All	Permanent	Temporary		
Salaries	25.4	25.9	25.2	49.7	43.8
Self-employment (incl. agric.)	14.5	14.1	14.6	14.2	14.3
Pensions	15.9	17.1	15.5	28.8	25.6
Remittances	43.4	42.3	43.8	4.7	14.2
Other	0.7	0.1	0.9	2.5	2.1

Source: Own elaboration based on 2017 RAU survey

Table A12. Distribution of spending categories for remittances received by migrant status, Armenia 2017

Spending categories	All	Permanent	Temporary
Food and clothes	36.6	30.8	35.8
Utilities	20.5	18.4	17.8
Pay debt	7.5	14.1	19.1
Medical expenses	13.6	11.3	5.5
Education	3.5	5.1	4.2
Other	18.3	20.4	17.5

Source: Own elaboration based on 2017 RAU survey

Table A13: Estimation results of bivariate probit with robust standard errors to account for clustered data at the household level, Armenia 2017.

	Women		Men	
	Work decision (1=Work, 0=Not work)	Migration decision (1=Not migrate, 0=Migrate)	Work decision (1=Work, 0=Not work)	Migration decision (1=Not migrate, 0=Migrate)
Married	-0.312***	0.0593	0.386***	0.182***
	(0.0634)	(0.0958)	(0.0492)	(0.0543)
Divorced	-0.0254	0.135	0.312***	0.332**
	(0.0725)	(0.125)	(0.110)	(0.139)
Widowed	-0.111	0.0876	0.235**	0.362**
	(0.0699)	(0.118)	(0.0993)	(0.152)
Age	0.147***	-0.0220***	0.100***	-0.0451***
	(0.00695)	(0.00817)	(0.00650)	(0.00693)
Age squared	-0.00163***	0.000292***	-0.00131***	0.000605***
	(7.37e-05)	(8.38e-05)	(6.76e-05)	(7.61e-05)
General secondary	0.0527	-0.117	-0.0244	-0.413***
	(0.0709)	(0.0998)	(0.0530)	(0.0622)
Pre-vocational and professional	0.345***	-0.161	0.127**	-0.368***
	(0.0724)	(0.108)	(0.0589)	(0.0707)
Higher or more education	0.766***	-0.263**	0.410***	-0.164**
	(0.0730)	(0.106)	(0.0600)	(0.0736)
Number of children in the household aged 6 years old or less	-0.130***	0.0930**	-0.0258	0.0400
	(0.0203)	(0.0472)	(0.0212)	(0.0268)
Number of children in the household aged between 7 and 14 years old	-0.0344*	0.127***	-0.0627***	0.0372
	(0.0197)	(0.0404)	(0.0195)	(0.0235)
Number of other employed members in the household	0.0272	0.294***	0.0770***	0.126***
	(0.0179)	(0.0373)	(0.0182)	(0.0201)
Enrolled in education	-0.695***		-0.730***	
	(0.0981)		(0.0773)	
Migration networks		-1.684***		-2.097***
		(0.451)		(0.228)
Urban area other than Yerevan	-0.0698**	0.0172	-0.198***	-0.239***
	(0.0349)	(0.0723)	(0.0384)	(0.0490)
Rural area	-0.0627	0.224*	-0.376***	-0.239***
	(0.0557)	(0.119)	(0.0569)	(0.0663)
Spouse	-0.270***	0.0231	-0.715***	-0.538***
	(0.0690)	(0.115)	(0.121)	(0.125)
Son/daughter	-0.0773	0.0282	-0.479***	-0.135***
	(0.0658)	(0.110)	(0.0408)	(0.0454)
Parent	-0.578***	-0.300*	-0.479***	-0.0755
	(0.116)	(0.178)	(0.175)	(0.207)

Other relative	-0.372***	-0.301***	-0.625***	-0.215***
	(0.0705)	(0.114)	(0.0667)	(0.0725)
Other non-relative	-0.555***	-0.424	-0.703*	-0.795*
	(0.178)	(0.266)	(0.362)	(0.446)
Dwelling rented	0.143**	-0.0709	0.214***	0.0389
	(0.0615)	(0.111)	(0.0699)	(0.0744)
Number of rooms in the household	-0.0214	-0.0342	-0.00407	-0.0156
	(0.0134)	(0.0256)	(0.0136)	(0.0163)
Centralized water supply	0.186*	-0.0494	-0.275***	0.0905
	(0.0952)	(0.212)	(0.0909)	(0.0939)
Hot running water	0.142***	-0.191**	0.207***	0.0119
	(0.0479)	(0.0973)	(0.0470)	(0.0566)
Centralized sanitation compaund	-0.0795	0.239**	-0.0746	0.114
	(0.0607)	(0.117)	(0.0589)	(0.0702)
Local sanitation compaund/hole with waste products	0.0701	0.298***	-0.111**	-0.00258
	(0.0497)	(0.0985)	(0.0488)	(0.0572)
Toilet outside the dwelling	0.0129	-0.00276	0.107**	0.0192
	(0.0435)	(0.0925)	(0.0434)	(0.0507)
Centralized gas supply	-0.163***	0.0428	-0.148***	-0.0274
	(0.0406)	(0.0789)	(0.0394)	(0.0485)
Bathtub or shower	0.172**	0.0882	0.0600	0.00316
	(0.0675)	(0.124)	(0.0637)	(0.0720)
Kitchen	-0.134	0.0904	-0.0611	-0.182*
	(0.0906)	(0.166)	(0.0892)	(0.103)
Electricity	0.0340	-4.029***	0.108	-0.401
	(0.281)	(0.140)	(0.233)	(0.384)
Indoor tap water	-0.0265	-0.195	0.135**	-0.0638
	(0.0711)	(0.166)	(0.0647)	(0.0739)
Household can afford to keep home adequately warm	0.0165	0.0566	0.0591**	-0.0383
	(0.0277)	(0.0552)	(0.0288)	(0.0350)
Radio-receiver	-0.0778**	-0.0185	-0.0793**	0.0122
	(0.0320)	(0.0651)	(0.0323)	(0.0384)
Fixed telephone	0.0633*	0.00599	0.0221	0.0445
	(0.0338)	(0.0648)	(0.0347)	(0.0396)
Mobile phone	0.290*	0.440***	0.623***	0.370**
	(0.161)	(0.164)	(0.187)	(0.150)
Computer	0.112*	-0.0269	-0.0370	-0.115
	(0.0596)	(0.112)	(0.0676)	(0.0778)
Internet	0.00636	0.0594	0.0211	-0.00787
	(0.0599)	(0.112)	(0.0677)	(0.0777)
Color TV	0.195**	-0.0546	0.0486	-0.0672
	(0.0769)	(0.126)	(0.0799)	(0.0922)
Car	0.0464	-0.0242	0.357***	0.319***
	(0.0308)	(0.0623)	(0.0304)	(0.0365)
Constant	-3.864***	5.912***	-2.265***	2.524***
	(0.375)	(0.303)	(0.350)	(0.451)

Rho		0.3679***		0.7001***	
		(0.0355)		(0.0176)	
Observations	12,401	12,401	10,878	10,878

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

For both selection equations, age and age squared are statistically significant at 1% level with an inverse quadratic structure. In the case of the migration choice, it means that the propensity to not migrate first decrease with age and then increase. In the case of the work decision, it means the probability to work first increase with age and then decrease. Besides, higher levels of education increase the probability to work, but decrease the probability to not migrate, or, in other words, individuals with higher levels of educational attainment are more likely to migrate. The dummy variable indicating whether the individual is enrolled in education is negatively correlated with the probability to work and statistically significant at 1% level. In addition, the presence of young children in the household decrease the probability to work and increase the probability to not migrate. The coefficients are statistically significant only for women, reflecting the fact that women are the ones who are mainly responsible for children upbringing. The number of other employed members in the household is positively correlated with the propensity to stay (or not migrate), suggesting that households with higher work intensity are less likely to seek job opportunities abroad. Regarding the variables reflecting the relationship to the household head, all household's members are less likely to work than the household head. On the other hand, individuals outside the immediate family (household head, spouse, and son/daughter) are more likely to migrate, because they have less immediate responsibilities for child rearing and household provisioning. Not surprisingly, living in urban areas other than the capital or in rural areas is negatively correlated with the probability to work, being the coefficients statistically significant for both men and women. Moreover, not living in the capital increase the probability to not migrate for women, but reduce the probability to not migrate for men, which is consistent with the fact that most of migrants are men from rural or urban areas other than Yerevan. Our proxy for the presence of migration networks in the area of residency is negatively correlated with the propensity to not migrate (or, positively correlated with the probability to migrate) and statistically significant at 1% level, suggesting that the access to migration networks is fundamental for the migration choice. In relation to household's living conditions and household's assets holding, variables that reflect better living conditions and higher income levels, in general, increase the probability to work, but have mixed effects on the probability to not migrate, although most of them are not statistically significant.

Table A14: Regression coefficients of the log-earning equation with robust standard errors to account for clustered data at the household level, Armenia 2017.

	Women		Men	
	With correction by selection bias	Without correction by selection bias	With correction by selection bias	Without correction by selection bias
Married	0.187***	0.0284	-0.0439	0.0906***
	(0.0517)	(0.0328)	(0.0366)	(0.0327)
Divorced	-0.0596	-0.0720	-0.228***	-0.125
	(0.0489)	(0.0492)	(0.0834)	(0.0843)
Widowed	0.115*	0.0235	-0.0635	0.0309
	(0.0612)	(0.0573)	(0.0980)	(0.0980)
Age	-0.0149	0.0256***	0.0103	0.0310***
	(0.0136)	(0.00749)	(0.00961)	(0.00608)
Age squared	8.91e-05	-0.000337***	-0.000156	-0.000434***
	(0.000150)	(8.46e-05)	(0.000119)	(6.80e-05)
General secondary	0.0663	0.0541	0.0674	0.0351
	(0.105)	(0.105)	(0.0572)	(0.0524)
Pre-vocational and professional	0.105	0.191*	0.0744	0.111**
	(0.108)	(0.105)	(0.0610)	(0.0545)
Higher or more education	0.277**	0.509***	0.195***	0.369***
	(0.123)	(0.104)	(0.0629)	(0.0524)
Household size	-0.0298***	-0.0276***	-0.0165**	-0.00792
	(0.00914)	(0.00764)	(0.00805)	(0.00750)
Urban area other than Yerevan	-0.178***	-0.230***	-0.0971***	-0.202***
	(0.0261)	(0.0252)	(0.0284)	(0.0225)
Rural area	-0.415***	-0.416***	-0.183***	-0.306***
	(0.0308)	(0.0307)	(0.0295)	(0.0256)
Household head	0.0121	0.0720	-0.101***	0.0766***
	(0.0461)	(0.0438)	(0.0346)	(0.0267)
Inverse Mill's ratio for work decision	0.590***		0.461***	
	(0.128)		(0.0779)	
Inverse Mill's ratio for non-migration decision	0.169***		0.136*	
	(0.0525)		(0.0758)	
Constant	13.48***	13.41***	13.47***	13.62***
	(0.265)	(0.179)	(0.243)	(0.135)
Observations	3,619	3,619	4,770	4,770
R-squared	0.200	0.185	0.142	0.126
r2_a	0.197	0.182	0.140	0.124

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Labor earnings for migrants are predicted using a double selection model that accounts simultaneously for both the migration choice and the non-migrant's employment decision. In order to generate consistent estimates of migrant's labor earnings, we follow the methodology proposed by Tunali (1986), which extended the specification of Heckman (1979) to model jointly two selection criteria. This methodology was later used by Barham and Boucher (1998). The procedure can be divided in two steps. The first step consists in estimating jointly, through a bivariate probit model, the propensity to not migrate and the propensity to work. Then, the estimated parameters from the bivariate probit are used to calculate the selection inverse Mill's ratio (the probability that an individual decides to not migrate (work) over the cumulative probability of his/her individual's decision), λ_i, for each selection rule and for each individual. The second step entails running a linear regression model for the determinants of individual labor earnings, including as explanatory variables the selection inverse Mill's ratios calculated previously. If the inverse Mill's ratios are statistically significant in the earning equation, it suggests that the choices of non-migration and employment are indeed correlated with factors that affect labor earnings. The identification of the model requires a set of variables that are related to the migration choice but do not affect directly labor earnings. Also, we need to have a set of variables that are related to the probability to work but do not affect directly labor earnings. We employ as an exclusion restriction for the non-migration selection equation a proxy for the presence of migrant networks in the area of residency: the percentage of households receiving remittances in a given stratum, where the strata are defined by the interaction of region (marz) and degree of urbanization (urban-rural). The exclusion restrictions employed for the probability to work are the number of children in the household aged 6 or less years old, the number of children in the household aged between 7 and 14 years old, and a dummy variable indicating if the individual is enrolled in education.

When including the selection correction terms, age an age squared are not statistically significant. As expected, the higher the level of educational attainment, the higher the expected earnings. Higher education or more is the only level of education statistically significant, at 5% level for women and at 1% level for men. Besides, the variable indicating whether the individual is the household head is only significant for men and positively correlated with earnings, meaning that expected earnings are higher for male headed than for other members of the household, but not for female headed. In addition, geographic location variables are statistically significant and negatively correlated with earnings, being the expected earnings for individuals living in urban areas other than the capital or in rural areas lower than the expected earnings for those living in Yerevan. Finally, the two selection correction terms are highly correlated with earnings and both are statistically significant either for women or men. This suggests that the sub-sample of non-migrant who work is not randomly selected from the population, and consequently, the parameters estimated via OLS without controlling for selection are biased.

Table A15: Descriptive statistics for observed and predicted log-consumption of the sample of non-migrants who work, Armenia 2017.

| | Women | | | | | | Men | | | | | |
	Mean	*p10*	*p25*	*p50*	*p75*	*p90*	*Mean*	*p10*	*p25*	*p50*	*p75*	*p90*
Observed	13.81	12.88	13.43	13.85	14.36	14.58	14.12	13.30	13.81	14.20	14.53	14.89
Predicted	13.81	13.36	13.53	13.81	14.07	14.30	14.12	13.78	13.92	14.10	14.30	14.50
Difference	0.00	-0.48	-0.10	0.04	0.30	0.28	0.00	-0.48	-0.12	0.10	0.23	0.39

Table A16: Poverty rate and inequality indexes in the counterfactual scenarios of non-migration, assuming migrants from migrant households not receiving remittances do not migrate and do not work, Armenia 2017.

	Scenario 1: Migrants' employment rate 26%		Scenario 2: Migrants' employment rate 33%		Scenario 3: Migrants' employment rate 40%	
	All	Migrant households	All	Migrant households	All	Migrant households
Poverty	30.7	44.3	29.9	41.2	29.3	38.6
Gini	31.6	39.4	31.7	39.6	31.5	39.0
p90/p10	3.2	5.3	3.2	5.4	3.1	5.3
p90/p50	1.8	2.1	1.8	2.1	1.8	2.1
p50/p10	1.7	2.6	1.7	2.6	1.7	2.5

Table A17: Poverty rate and inequality indexes in the counterfactual scenarios of non-migration, assuming migrants from migrant households not receiving remittances do not migrate and they might have imputed labor earnings if they are classified as employed, Armenia 2017.

	Scenario 1: Migrants' employment rate 26%		Scenario 2: Migrants' employment rate 33%		Scenario 3: Migrants' employment rate 40%.	
	All	Migrant households	All	Migrant households	All	Migrant households
Poverty	30.2	42.2	29.3	38.8	28.6	35.9
Gini	32.8	43.4	33.1	43.9	33.4	44.0
p90/p10	3.3	6.4	3.4	7.0	3.4	7.1
p90/p50	1.9	2.4	1.9	2.5	1.9	2.5
p50/p10	1.8	2.7	1.7	2.8	1.7	2.8

Table A18: Average consumption by deciles of the consumption distribution, Armenia 2017

Consumption deciles	Baseline	Remittances as exogenous transfers	Non-migration counterfactual scenarios		
			Scenario 1 (migrant's employment rate 26%)	Scenario 2 (migrant's employment rate 33%)	Scenario 3 (migrant's employment rate 40%)
1	28,710	26,843	27,226	27,350	27,608
2	36,800	35,245	36,052	36,173	36,299
3	41,642	39,515	40,343	40,558	41,449
4	46,662	43,388	44,399	44,900	45,354
5	51,678	47,654	49,775	50,000	50,429
6	57,206	53,410	54,689	55,517	56,552
7	64,899	60,305	63,427	63,936	64,335
8	73,387	67,188	69,801	70,082	70,774
9	85,993	79,963	83,241	84,392	85,111
10	169,941	155,405	165,070	165,725	168,275
Total	65,684	61,271	63,809	64,272	65,033